Calculus I　复习专题四　　第九章　　解微分方程

1.(2022年期末) Use Euler's method to find the approximation for the solution of $y' = 1 + xy, y(0) = 1$. Take $dx = 0.5$, and start at $x_0 = 0, y_0 = 1$. Then $y_2 = (\quad)$.

2. Solve the following first-order linear differential equation

(1) $xy' + 2y = x^2 + 1, \quad x > 0$. (2022年期末)

(2) $y' - \frac{1}{x}y = 2x \ln x, \quad x > 0$. (2021年期末)

(3) $xy' + (x-2)y = 3x^3 e^{-x}, y(1) = 0, \quad x > 0$. (2020年期末)

3. (2019年期末) An 1600-L tank is half full of fresh water; i.e., contains 800-L of fresh water. At the time t = 0, a solution containing 0.0625 kg/L of salt runs into the tank at the rate of 16 L/min, and the mixture is pumped out of the tank at the rate of 8 L/min. At the time the tank is full, how many kilograms of salt will it contain ?